



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: LEAP-1A29  
UNIQUE ID NUMBER: 01P20CM130  
COMBUSTOR: TAPS II  
ENGINE TYPE: TF  
BYPASS RATIO: 10.7  
PRESSURE RATIO ( $\pi_{00}$ ): 35.5  
RATED THRUST ( $F_{00}$ ) (kN): 130.3

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>00</sub> (g/kN) or SN	0.4	27.6	45.6	1.8
AS % OF ORIGINAL LIMIT	2.2	23.4	41.1	8.3
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			51.3	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			58.4	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			65.1	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			74.5	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### DATA STATUS

- PRE-REGULATION  
x CERTIFICATION  
- REVISED (SEE REMARKS)

### TEST ENGINE STATUS

x NEWLY MANUFACTURED ENGINES  
x DEDICATED ENGINES TO PRODUCTION STANDARD  
- OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
(ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)  
- OUT OF PRODUCTION (DATE: - )  
- OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>00</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
TAKE-OFF	100	0.7	0.946	0.04	0.27	49.48	1.1
CLIMB OUT	85	2.2	0.777	0.02	0.23	21.03	1.2
APPROACH	30	4.0	0.261	0.04	2.21	9.27	1.3
IDLE	7	26.0	0.094	0.25	20.30	4.72	1.3
LTO TOTAL FUEL (kg) or EMISSIONS (g)			352	43	3150	5396	-
NUMBER OF ENGINES				2	2	2	2
NUMBER OF TESTS				4	4	4	4
AVERAGE D <sub>p</sub> /F <sub>00</sub> (g/kN) or AVERAGE SN (MAX)				0.3	24.3	41.4	1.6
SIGMA (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0.0	1.2	1.9	0.2
RANGE (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0.28-0.37	22.82-25.46	39.23-43.27	1.47-1.82

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW)  
STAGE BLEED 0 (% CORE FLOW)

AT All POWER SETTINGS  
AT All POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	97.8-98.8
TEMPERATURE (K)	274.6-279.8
ABS HUMIDITY (kg/kg)	0.002-0.0032

### FUEL

SPEC	Jet A
H/C	1.9
AROM (%)	16.5

MANUFACTURER: CFM International  
TEST ORGANIZATION: General Electric Company  
TEST LOCATION: PTO, Ohio  
TEST DATES: 21/11/2016-02/12/2016

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

### REMARKS

1. Ref. Report CRL-2201\_2/Rev. 1
2. Engine S/N 600-104, 600-105
3. SN for each LTO mode is average of max SN for test points around that power setting
4. AVERAGE SN (MAX) is average of maximum SN measured from all points on each run
5. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
6. NO<sub>x</sub> levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

Compliance with Fuel Venting requirements: x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)